

**CPC****COOPERATIVE PATENT CLASSIFICATION****H01P****WAVEGUIDES; RESONATORS, LINES, OR OTHER DEVICES OF THE WAVEGUIDE TYPE** (operating at optical frequencies [G02B](#); aerials [H01Q](#);

{modulating electromagnetic waves in transmission line, waveguide, cavity resonator or radiation field of aerial [H03C 7/02](#)}; networks comprising lumped impedance elements [H03H](#))

**NOTE**

In this subclass, the following expression is used with the meaning indicated :

- "waveguide type" as applied to transmission lines includes only high-frequency coaxial cables or Lecher lines, and as applied to resonators, delay lines, or other devices includes all devices having distributed inductance and capacitance.

**H01P 1/00****Auxiliary devices** (coupling devices of the waveguide type [H01P 5/00](#))**H01P 1/005**

- . {Diode mounting means}

**H01P 1/02**

- . Bends; Corners; Twists

**H01P 1/022**

- .. {in waveguides of polygonal cross-section ([H01P 1/065](#) takes precedence)}

**H01P 1/025**

- ... {in the E-plane}

**H01P 1/027**

- ... {in the H-plane}

**H01P 1/04**

- . Fixed joints ({pipe joints [F16L](#)}; line connectors [H01R](#); cable fittings [H02G 15/00](#))

**H01P 1/042**

- .. {Hollow waveguide joints}

**H01P 1/045**

- .. {Coaxial joints}

**H01P 1/047**

- .. {Strip line joints}

**H01P 1/06**

- . Movable joints, e.g. rotating joints

**H01P 1/061**

- .. {the relative movement being a translation along an axis common to at least two rectilinear parts, e.g. expansion joints}

**H01P 1/062**

- .. {the relative movement being a rotation}

**H01P 1/063**

- ... {with a limited angle of rotation}

**H01P 1/064**

- .... {the axis of rotation being perpendicular to the transmission path, e.g. hinge joint}

**H01P 1/065**

- .... {the axis of rotation being parallel to the transmission path, e.g. stepped twist}

**H01P 1/066**

- ... {with an unlimited angle of rotation}

**H01P 1/067**

- .... {the energy being transmitted in only one line located on the axis of rotation}

- H01P 1/068 . . . . {the energy being transmitted in at least one ring-shaped transmission line located around the axis of rotation, e.g. "around the mast" rotary joint ([H01P 1/069](#) takes precedence; coaxial line with solid inner conductor [H01P 1/067](#))}
- H01P 1/069 . . . . {the energy being transmitted in at least one ring-shaped transmission line located around an axial transmission line; Concentric coaxial systems}
- H01P 1/08 . Dielectric windows ([coupling devices for transit time tubes H01J 23/36](#))
- H01P 1/10 . for switching or interrupting {(in systems using reflection or reradiation of radio, acoustic or other waves [G01S 7/034](#))}
- H01P 1/11 . . by ferromagnetic devices
- H01P 1/12 . . by mechanical chopper
- H01P 1/122 . . . {Waveguide switches}
- H01P 1/125 . . . {Coaxial switches}
- H01P 1/127 . . . {Strip line switches}
- H01P 1/14 . . by electric discharge devices ([discharge devices H01J 17/64](#))
- H01P 1/15 . . by semiconductor devices
- H01P 1/16 . for mode selection, e.g. mode suppression or mode promotion; for mode conversion ([linking dissimilar lines or devices H01P 5/08](#))
- H01P 1/161 . . sustaining two independent orthogonal modes, e.g. orthomode transducer {(combining or separating polarisations and frequencies [H01P 1/2131](#))}
- H01P 1/162 . . absorbing spurious or unwanted modes of propagation
- H01P 1/163 . . specifically adapted for selection or promotion of the TE 01 circular-electric mode
- H01P 1/165 . for rotating the plane of polarisation
- H01P 1/17 . . for producing a continuously rotating polarisation, e.g. circular polarisation
- H01P 1/171 . . . {using a corrugated or ridged waveguide section}
- H01P 1/172 . . . {using a dielectric element}
- H01P 1/173 . . . {using a conductive element}
- H01P 1/174 . . . {using a magnetic element ([H01P 1/175](#) takes precedence)}
- H01P 1/175 . . using Faraday rotators
- H01P 1/18 . Phase-shifters ([H01P 1/165](#) takes precedence; coupling devices with variable coupling factor [H01P 5/04](#))
- H01P 1/181 . . {using ferroelectric devices}
- H01P 1/182 . . {Waveguide phase-shifters ([H01P 1/181](#), [H01P 1/185](#), [H01P 1/19](#) take precedence)}
- H01P 1/183 . . {Coaxial phase-shifters ([H01P 1/181](#), [H01P 1/185](#), [H01P 1/19](#) take precedence)}
- H01P 1/184 . . {Strip line phase-shifters ([H01P 1/181](#), [H01P 1/185](#), [H01P 1/19](#) take precedence)}
- H01P 1/185 . . using a diode or a gas filled discharge tube
- H01P 1/19 . . using a ferromagnetic device
- H01P 1/195 . . . having a toroidal shape
- H01P 1/20 . Frequency-selective devices, e.g. filters {(variable impedance transformers, e.g. slug tuners or stub tuners [H01P 5/04](#); resonators [H01P 7/00](#))}

H01P 1/2002	..	{Dielectric waveguide filters ( <a href="#">H01P 1/212</a> , <a href="#">H01P 1/213</a> , <a href="#">H01P 1/215</a> , <a href="#">H01P 1/219</a> take precedence)}
H01P 1/2005	..	{ Electromagnetic photonic bandgaps [EPB], or photonic bandgaps [PBG] }
H01P 1/2007	..	{Filtering devices for biasing networks or DC returns}
H01P 1/201	..	Filters for transverse electromagnetic waves( <a href="#">H01P 1/212</a> , <a href="#">H01P 1/213</a> , <a href="#">H01P 1/215</a> , <a href="#">H01P 1/219</a> take precedence)
H01P 1/2013	...	{Coplanar line filters}
H01P 1/2016	...	{Slot line filters; Fin line filters}
H01P 1/202	...	Coaxial filters ( <a href="#">cascaded coaxial cavities</a> <a href="#">H01P 1/205</a> )
H01P 1/203	...	Strip line filters
H01P 1/20309	....	{with dielectric resonator}
H01P 1/20318	.....	{ with dielectric resonators as non-metallised opposite openings in the metallised surfaces of a substrate}
H01P 1/20327	....	{ Electromagnetic interstage coupling}
H01P 1/20336	.....	{Comb or interdigital filters}
H01P 1/20345	.....	{ Multilayer filters}
H01P 1/20354	.....	{ Non-comb or non-interdigital filters}
H01P 1/20363	.....	{ Linear resonators}
H01P 1/20372	.....	{Hairpin resonators}
H01P 1/20381	.....	{ Special shape resonators}
H01P 1/2039	....	{ Galvanic coupling between Input/Output}
H01P 1/205	..	Comb or interdigital filters; Cascaded coaxial cavities ( <a href="#">H01P 1/203</a> takes precedence)
H01P 1/2053	....	{the coaxial cavity resonators being disposed parall to each other}
H01P 1/2056	....	{Comb filters or interdigital filters with metallised resonator holes in a dielectric block}
H01P 1/207	..	Hollow waveguide filters ( <a href="#">H01P 1/212</a> , <a href="#">H01P 1/213</a> , <a href="#">H01P 1/215</a> , <a href="#">H01P 1/219</a> take precedence)
H01P 1/208	...	Cascaded cavities; Cascaded resonators inside a hollow waveguide structure ( <a href="#">H01P 1/205</a> takes precedence)
H01P 1/2082	....	{with multimode resonators ( <a href="#">H01P 1/2086</a> takes precedence)}
H01P 1/2084	....	{with dielectric resonators}
H01P 1/2086	.....	{multimode}
H01P 1/2088	....	{ Integrated in a substrate}
H01P 1/209	..	comprising one or more branching arms or cavities wholly outside the main waveguide
H01P 1/211	...	Waffle-iron filters; Corrugated structures
H01P 1/212	..	suppressing or attenuating harmonic frequencies ( <a href="#">H01P 1/215</a> takes precedence)
H01P 1/213	..	combining or separating two or more different frequencies ( <a href="#">H01P 1/215</a> takes precedence)
H01P 1/2131	...	{with combining or separating polarisations}
H01P 1/2133	...	{using coaxial filters ( <a href="#">H01P 1/2131</a> , <a href="#">H01P 1/2136</a> take precedence)}
H01P 1/2135	...	{using strip line filters ( <a href="#">H01P 1/2131</a> takes precedence)}
H01P 1/2136	...	{using comb or interdigital filters; using cascaded coaxial cavities ( <a href="#">H01P 1/2131</a> , <a href="#">H01P 1/2135</a> take precedence)}

H01P 1/2138	... {using hollow waveguide filters ( <a href="#">H01P 1/2131</a> takes precedence)}
H01P 1/215	.. using ferromagnetic material
H01P 1/217	... the ferromagnetic material acting as a tuning element in resonators
H01P 1/218	... the ferromagnetic material acting as a frequency selective coupling element, e.g. YIG-filters
H01P 1/219	.. Evanescent mode filters
H01P 1/22	. Attenuating devices ( <a href="#">dissipative terminating devices H01P 1/26</a> )
H01P 1/222	.. {Waveguide attenuators ( <a href="#">H01P 1/23</a> takes precedence)}
H01P 1/225	.. {Coaxial attenuators ( <a href="#">H01P 1/23</a> takes precedence)}
H01P 1/227	.. {Strip line attenuators ( <a href="#">H01P 1/23</a> takes precedence)}
H01P 1/23	.. using ferromagnetic material
H01P 1/24	. Terminating devices
H01P 1/26	.. Dissipative terminations
H01P 1/262	... {the dissipative medium being a liquid or being cooled by a liquid}
H01P 1/264	... {Waveguide terminations ( <a href="#">H01P 1/262</a> takes precedence)}
H01P 1/266	... {Coaxial terminations ( <a href="#">H01P 1/262</a> takes precedence)}
H01P 1/268	... {Strip line terminations ( <a href="#">H01P 1/262</a> takes precedence)}
H01P 1/28	.. Short-circuiting plungers ( <a href="#">coupling devices with variable coupling factor H01P 5/04</a> )
H01P 1/30	. for compensation of, or protection against, temperature or moisture effects; {for improving power handling capability ( <a href="#">H01P 1/04</a> , <a href="#">H01P 1/08</a> take precedence)}
H01P 1/32	. Non-reciprocal transmission devices ( <a href="#">H01P 1/02</a> to <a href="#">H01P 1/30</a> take precedence)
H01P 1/36	.. Isolators
H01P 1/362	... {Edge-guided mode devices}
H01P 1/365	... Resonance absorption isolators
H01P 1/37	... Field displacement isolators
H01P 1/375	... using Faraday rotators
H01P 1/38	.. Circulators
H01P 1/383	... Junction circulators, e.g. Y-circulators
H01P 1/387	.... Strip line circulators
H01P 1/39	.... Hollow waveguide circulators
H01P 1/393	... using Faraday rotators
H01P 1/397	... using non- reciprocal phase shifters ( <a href="#">H01P 1/393</a> takes precedence)
<b>H01P 3/00</b>	<b>Waveguides; Transmission lines of the waveguide type</b>
H01P 3/003	. {Coplanar lines}
H01P 3/006	.. {Conductor backed coplanar waveguides}
H01P 3/02	. with two longitudinal conductors
H01P 3/023	.. {Fin lines; Slot lines}

- H01P 3/026 .. { Coplanar striplines (CPS)}
- H01P 3/04 .. Lines formed as Lecher wire pairs
- H01P 3/06 .. Coaxial lines (not suitable for handling frequencies considerably beyond the audio range, {coaxial cables in general} [H01B 11/18](#))

#### **NOTE**

This subgroup is only used for documents disclosing typical HF-features of coaxial cables, e.g. propagation of non-TEM-modes, multimoding, oversized coaxial cables, particular cross-section adapted for HF-propagation

- H01P 3/08 .. Microstrips; Strip lines
- H01P 3/081 ... { Micro-striplines}
- H01P 3/082 .... { Multilayer dielectric}
- H01P 3/084 .... { Suspended micro-striplines}
- H01P 3/085 ... { Triplate lines}
- H01P 3/087 .... { Suspended triplate lines}
- H01P 3/088 ... { Stacked transmission lines}
  
- H01P 3/10 . Wire waveguides, i.e. with a single solid longitudinal conductor
  
- H01P 3/12 . Hollow waveguides ([H01P 3/20](#) takes precedence)
- H01P 3/121 .. { integrated in a substrate}
- H01P 3/122 .. { Dielectric loaded (not air)}
- H01P 3/123 .. with a complex or stepped cross-section, e.g. ridged or grooved waveguides ([H01P 3/14](#) takes precedence)
- H01P 3/127 .. with a circular, elliptic, or parabolic cross-section
- H01P 3/13 .. specially adapted for transmission of the TE<sub>01</sub> circular-electric mode {(selection, promotion [H01P 1/163](#))}
- H01P 3/14 .. flexible
  
- H01P 3/16 . Dielectric waveguides, i.e. without a longitudinal conductor
- H01P 3/165 .. { Non-radiating dielectric waveguides}
  
- H01P 3/18 . built-up from several layers to increase operating surface, i.e. alternately conductive and dielectric layers
  
- H01P 3/20 . Quasi-optical arrangements for guiding a wave, e.g. focusing by dielectric lenses (quasi-optical devices in general [H01Q 15/00](#))
  
- H01P 5/00** **Coupling devices of the waveguide type** (non-reciprocal devices [H01P 1/32](#); for introducing or removing wave energy to or from the discharge in transit-time tubes [H01J 23/36](#))
  
- H01P 5/02 . with invariable factor of coupling ([H01P 5/12](#) takes precedence {choke joints [H01P 1/04](#), [H01P 1/06](#)})
- H01P 5/022 .. {Transitions between lines of the same kind and shape, but with different dimensions}
- H01P 5/024 ... {between hollow waveguides}

- H01P 5/026 ... {between coaxial lines}
- H01P 5/028 ... {between strip lines}
- H01P 5/04 . with variable factor of coupling
- H01P 5/08 . for linking dissimilar lines or devices ([H01P 1/16](#), [H01P 5/04](#) take precedence; linking lines of the same kind but with different dimensions [H01P 5/02](#))
- H01P 5/082 .. {Transitions between hollow waveguides of different shape, e.g. between a rectangular and a circular waveguide}
- H01P 5/085 .. {Coaxial-line/strip-line transitions}
- H01P 5/087 .. {Transitions to a dielectric waveguide}
- H01P 5/10 .. for coupling balanced with unbalanced lines or devices
- H01P 5/1007 ... {Microstrip transitions to Slotline or finline}
- H01P 5/1015 ... {Coplanar line transitions to Slotline or finline}
- H01P 5/1022 ... {Transitions to dielectric waveguide}
- H01P 5/103 ... Hollow-waveguide/coaxial-line transitions
- H01P 5/107 ... Hollow-waveguide/strip-line transitions
- H01P 5/12 . Coupling devices having more than two ports ([H01P 5/04](#) takes precedence)
- H01P 5/16 .. Conjugate devices, i.e. devices having at least one port decoupled from one other port
  - H01P 5/18 ... consisting of two coupled guides, e.g. directional couplers
    - H01P 5/181 .... {the guides being hollow waveguides}
      - H01P 5/182 ..... {the waveguides being arranged in parallel}
      - H01P 5/183 .... {at least one of the guides being a coaxial line}
      - H01P 5/184 .... {the guides being strip lines or microstrips}
        - H01P 5/185 ..... { Edge coupled lines}
        - H01P 5/186 ..... { Lange couplers}
        - H01P 5/187 ..... { Broadside coupled lines}
      - H01P 5/188 .... {the guides being dielectric waveguides}
    - H01P 5/19 ... of the junction type
      - H01P 5/20 .... Magic-T junctions
      - H01P 5/22 .... Hybrid ring junctions
        - H01P 5/222 ..... { 180° rat race hybrid rings}
        - H01P 5/225 ..... { 180° reversed phase hybrid rings}
        - H01P 5/227 ..... { 90° branch line couplers}
- H01P 7/00** **Resonators of the waveguide type** ({ variable impedance transformers [H01P 5/04](#); structurally associated with transit-time tubes and interacting with the discharge therein [H01J 23/18](#); { generators of electronic oscillations using resonators of this type [H03B 5/18](#), [H03B 7/14](#), [H03B 9/14](#); electronic amplifiers using resonators of this type [H03F 3/54](#); microwave heating devices [H05B 6/64](#))
- H01P 7/005 . {Helical resonators; Spiral resonators}
- H01P 7/02 . Lecher resonators

- H01P 7/04 . Coaxial resonators
- H01P 7/06 . Cavity resonators
- H01P 7/065 . . {integrated in a substrate}
- H01P 7/08 . Strip line resonators
- H01P 7/082 . . { Microstripline resonators ([H01P 7/088](#) takes precedence)}
- H01P 7/084 . . { Triplate line resonators ([H01P 7/088](#) takes precedence)}
- H01P 7/086 . . { Coplanar waveguide resonators ([H01P 7/088](#) takes precedence)}
- H01P 7/088 . . { Tunable resonators}
- H01P 7/10 . Dielectric resonators
- H01P 7/105 . . { Multimode resonators}
- H01P 9/00** **Delay lines of the waveguide type** (structurally associated with transit-time tubes and interacting with the discharge therein [H01J 23/24](#))
- H01P 9/003 . {Delay equalizers}
- H01P 9/006 . {Meander lines}
- H01P 9/02 . Helical lines
- H01P 9/04 . Interdigital lines
- H01P 11/00** **Apparatus or processes specially adapted for manufacturing waveguides or resonators, lines, or other devices of the waveguide type** (manufacture of coaxial cables [H01B 13/00](#))
- H01P 11/001 . {Manufacturing waveguides or transmission lines of the waveguide type}
- H01P 11/002 . . {Manufacturing hollow waveguides}
- H01P 11/003 . . {Manufacturing lines with conductors on a substrate, e.g. strip lines, slot lines}
- H01P 11/005 . . {Manufacturing coaxial lines}
- H01P 11/006 . . {Manufacturing dielectric waveguides}
- H01P 11/007 . {Manufacturing frequency-selective devices ([resonators](#) [H01P 11/008](#))}
- H01P 11/008 . {Manufacturing resonators}